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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/811,660	03/19/2001	Akiteru Takatsuka	36856.447	9407

7590

10/23/2002

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EXAMINER

DOUGHERTY, THOMAS M

ART UNIT

PAPER NUMBER

2834

DATE MAILED: 10/23/2002

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/811,660

Applicant(s)

TAKATSUKA ET AL.

Examiner

Thomas M. Dougherty

Art Unit

2834

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 23 March 2001.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-24 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-24 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 13 June 2001 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____
- 4) ☐ Interview Summary (PTO-413) Paper No(s). _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other:

Conclusion

DETAILED ACTION

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(a) the invention was known or used by others in this country, or patented or described in a printed publication in this or a foreign country, before the invention thereof by the applicant for a patent.

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1-3, 7-9, 13-15 and 19-21 are rejected under 35 U.S.C. 102(b) as being anticipated by Sato et al. (US 5,424,602). Sato shows (figs. 38A-D) a method for selecting a piezoelectric transformer characteristic, comprising the steps of: connecting a primary-side driving section of a piezoelectric transformer (TR) to a high-frequency generator (f) while leaving a secondary-side generating section thereof in an open state (e.g. figs. 38B, 38D); causing said high-frequency generator to sequentially generate and sweep a high-frequency signal over a predetermined frequency range (4.58 MHz to 5.08Mz); measuring a resonant frequency (e.g. 1.835MHz) or a resonant resistance (1.38 ohms) or both of an input-impedance-versus-frequency characteristic of the piezoelectric transformer (TR); and selecting the characteristic (e.g. 1.38 ohms or 4.83 MHz, respectively) or of the piezoelectric transformer (TR) based on the value of the measured resonant frequency. The transformer in every figure is in an isolated state in which it is not mounted on a mounting substrate. Only the input-impedance-versus-frequency characteristic of the piezoelectric transformer is measured.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 4-6, 10-12, 16-18 and 22-24 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sato et al. (US 5,424,602) in view of Onishi et al. (JP 2000-216450). Given the invention of Sato et al. as noted above, it is not noted by them that they measure or determine the bandwidth of an input-impedance-versus-frequency characteristic of the piezoelectric transformer by subtracting a resonant-frequency f_r from an antiresonant-frequency f_a and selecting the characteristic of the piezoelectric transformer based on the value of the measured bandwidth. Onishi et al. note (see solution) a method for selecting a piezoelectric transformer characteristic, comprising the steps of: connecting (e.g. see fig. 1) a primary-side driving section of a piezoelectric transformer (2) to a high-frequency generator (E); causing said high-frequency generator to sequentially generate and sweep a high-frequency signal over a predetermined frequency range; measuring a resonant frequency (f_r) or a resonant resistance (see $|Y|$ of fig. 2 which is inverse of impedance) or both of an input-impedance-versus-frequency characteristic of the piezoelectric transformer (2); they measure or determine the bandwidth of an input-impedance-versus-frequency characteristic of the piezoelectric transformer by subtracting a resonant-frequency f_r from an antiresonant-frequency f_a and select the characteristic of the piezoelectric

transformer based on the value of the measured bandwidth. The transformer in every figure is in an isolated state in which it is not mounted on a mounting substrate. Onishi's secondary-side generating section is not shown as being in an open state. It would have been obvious to one having ordinary skill in the art to determine a characteristic of the piezoelectric transformer of Sato et al. based on the value of the measured bandwidth, determined by subtracting a resonant-frequency f_r from an antiresonant-frequency f_a , as is shown by Onishi, at the time of the Sato invention, since "the power conversion efficiency of a power conversion device is set to be maximum", as is noted by Onishi.

Claims 4-6, 10-12, 16-18 and 22-24 are further rejected under 35 U.S.C. 103(a) as being unpatentable over Sato et al. (US 5,424,602) in view of Kawada (US 3,778,648). Given the invention of Sato et al. as noted above, it is not noted by them that they measure or determine the bandwidth of an input-impedance-versus-frequency characteristic of the piezoelectric transformer by subtracting a resonant-frequency f_r from an antiresonant-frequency f_a and selecting the characteristic of the piezoelectric transformer based on the value of the measured bandwidth. Kawada shows (fig. 1) and notes (see col. 2, ll. 13-31) a method for selecting a piezoelectric transformer characteristic, comprising the steps of: connecting a primary-side driving section of a piezoelectric transformer to a high-frequency generator; causing said high-frequency generator to sequentially generate and sweep a high-frequency signal over a predetermined frequency range; measuring a resonant frequency (f_r) or a resonant resistance (see $|Z|$) or both of an input-impedance-versus-frequency characteristic of

the piezoelectric transformer; he measures or determines the bandwidth of an input-impedance-versus-frequency characteristic of the piezoelectric transformer by subtracting a resonant-frequency f_r from an antiresonant-frequency f_a and select the characteristic of the piezoelectric transformer based on the value of the measured bandwidth, which is required for determination of his driving frequency. He doesn't note that the transformer is in an isolated state in which it is not mounted on a mounting substrate. It is not known if Kawada's secondary-side generating section is in an open state.

It would have been obvious to one having ordinary skill in the art to determine a characteristic of the piezoelectric transformer of Sato et al. based on the value of the measured bandwidth, determined by subtracting a resonant-frequency f_r from an antiresonant-frequency f_a , as is shown by Kawada, at the time of the Sato invention, since "the power conversion efficiency of a power conversion device is set to be maximum", as has been noted.

Conclusion

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. The remaining prior art reads on at least some aspects of the Applicants' claimed invention. Sato et al. ('430) teach the same thing as noted above in their figures 38A-D and the discussion of these figures. Getman et al. ('104) and Fujitsu ('775) show necessity of frequency sweeping method for determining the resonant and anti-resonant frequencies of their piezoelectric device.

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Direct inquiry concerning this action to Examiner Dougherty at (703) 308-1628.

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October 18, 2002

Thomas M. Dougherty

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